Abstract

Title; The role of autophagy in bone marrow stromal cells

Introduction:
BMSCs have the ability to differentiate into other ectodermic, mesodermic and endodermic cell lines in a laboratory culture medium. Today, these cells play an important role in regenerative medicine and the repair of damaged tissues, cell therapy and gene therapy.
Due to the availability and high availability of these cells, the autologous transplantation and non-rejection properties of the transplant have been widely considered in restorative medicine. But these cells quickly disappear after transplantation to the affected area due to the oxidative stress or hypoxia conditions, as well as the deprivation of serum. These cells, after transplantation, are damaged by the spinal cord, or the ischemic region of the brain has a low lifetime due to oxidative and inflammatory cells. Therefore, ideas that increase the life of these cells play an important role in increasing the survival of these cells after transplantation.
Autophagy is a protective mechanism in response to cellular stress, and its non-regulation results in protein accumulation and damage to the organs. The stromal cells of the bone marrow during the period of the onset and the formation of various types of cells are subject to stress.
Autophagy acts as a protective process for the cell against metabolic stress. In this study, the role of P62 protein, which is effective in autophagy and antioxidant defense, is investigated in bone marrow stromal cells exposed to H2O2. The expression of P62 protein was evaluated by immunohistochemistry.

Method: Bone marrow stromal cells were isolated from rats and placed in three DMEM / F12 culture media. The mortality rate of cells in the third passage after exposure to different concentrations of H2O2 was evaluated by trypan blue for 8 hours, also the immunocytochemistry activity of p62 protein was evaluated.

Results: In the vaibility test, bone marrow stromal cells in the third passage exposed to H2O2 survived after 8 hours in the group receiving 50, 100, 200, 400 μM H2O2, 82%, 72%, 49%, respectively. 39% of the control group, and with increase in H2O2 concentration, the magnitude of cerebrospinal fluid and cellular mellitus increased. Protein P62, an autoimmune marker, was activated in H2O2 cells and increased in cytoplasm as autophagic vacuoles.

Conclusion: In this study, bone marrow stromal cells with H2O2 suffered from cell death, which also increased with H2O2 increase in cell death, as well as the expression of P62 protein in cell cytoplasm increased, which according to other studies showed decreased autophagia and increased expression of genes An antioxidant pathway.

Key words: Bone marrow stromal cells, P62, Oxidative stress, H2O2